

waters with which not a few towns in the North of England are supplied, act upon the leaden service-pipes to such an extent as to become dangerous. It may even be questioned whether an occasional epidemic of fever is not a smaller evil than the continued occurrence of lead-poisoning. The use of iron service-pipes, or of lead thickly lined with tin, is troublesome and expensive. Perhaps sooner or later some unobjectionable material may be found to take the place of lead in the manufacture of water-piping.

A well-known authority on water analysis reminds us that waters from the mountains of Wales, Cumberland, &c., may possibly hold lead and copper in solution, and one has been found to contain appreciable quantities of arsenic. Great care would therefore be necessary in the selection of a supply from such districts.

The hardness of the New River water, of that furnished by the Kent Company, and indeed of the London water-supply in general, has often been complained of, and the softness of the northern waters has been urged in their favour. It is, however, by no means certain that from a sanitary point of view a soft water deserves the preference. Many medical authorities contend that a water of moderate hardness is preferable, for dietetic consumption, to such waters as are supplied to Huddersfield, Leeds, Manchester, &c. It is urged, not without a show of probability that a supply of calcareous salts in drinking-water is especially advantageous in the formation of the bones of young children. Dr. C. Cameron of Dublin, however, maintains that there has been an improvement in the public health of Dublin since the soft water of the Vartry was substituted for the hard water with which that city was formerly supplied. Further inquiry, therefore, is necessary in this direction. It seems to us, however, that there is hardness and hardness. The hardness of water may be due to lime salts or to magnesian compounds. For the latter there is comparatively little need in the human system, and their regular ingestion is found unfavourable to health. But to condemn any water as prejudicial merely on the ground of hardness seems to us rash in the extreme, in view of the high standard of health existing in districts where hard waters only are available.

It has been proposed to increase the London supply by means of a system of artesian wells. Unfortunately, though a single such well may yield a large and continuous supply of water, this quantity cannot be multiplied by sinking similar wells in the neighbourhood, as has been found in the case of the celebrated well of Grenelle. Among the many schemes enumerated by Mr. Bevan, there is one prominent in its singularity. Shafts were to be sunk down to the chalk on each side of the Thames every quarter of a mile. Each such shaft was to have a canal communication with the river between high and low water mark, through which these shafts were to be filled with water. At some distance from each descending shaft another was to be sunk, into which the filtered water would flow as in an inverted siphon, until it rose to the level of the river. The water of deep wells is in general remarkable for its freedom from organic pollution. But this purity probably depends on the slowness of the filtration by which they are supplied.

Our author, after giving the details of a great number of projects, comes to no decided conclusion. He remarks

that one of them will ultimately be adopted for the very good reason that a change of some kind will eventually be necessary. But he judiciously adds, "It need not be looked upon as in any way superseding the arrangements of the present supply."

#### FLOWERS AND THEIR PEDIGREES

*Flowers and their Pedigrees.* By Grant Allen. (London: Longmans, Green, and Co., 1883.)

THIS book consists of eight short essays on the evolution and distribution of plants which originally appeared as articles in several of the London magazines, supplemented with an introductory chapter. Two of these essays treat of the reasons for the presence of certain plants in our insular flora, as illustrated by the Hairy Spurge (*Euphorbia pilosa*, L.) and the Mountain Tulip (*Lloydia serotina*, Rchb.). The remainder discuss the evolution of certain types of plants, the examples taken being the daisy, strawberries, cleavers, wheat, the family of Rosaceæ, and the cuckoo-pint. The articles are written in the author's well-known pleasant style, and cannot fail to attract and interest many who have never previously turned their attention to the study of our common weeds.

Mr. Grant Allen has a great horror of a "microscopical critic," which he defines as "a learned and tedious person who goes about the world proclaiming to everybody that you don't know something because you don't happen to mention it." After reading this book, however, one feels tempted to reassure him on this head. For the work contains a considerable number of things which we may venture to state nobody ever knew before. Take, for instance, the text of the fifth essay, that on the origin of wheat: "Wheat ranks by descent as a degenerate and degraded lily"; and again, "While the daisy has gone constantly up and while the goose-grass has fallen but a little after a long course of upward development, the grasses generally have from the very first exhibited a constant and unbroken structural decline." This, we think, will be an entirely new view to the botanical morphologist. On these lines he proceeds to trace the evolution of the wheat-plant, from an imaginary primitive Monocotyledon, and suggests that *Alisma ranunculoides* might represent the earliest petal-bearing type in this line of development, except for the fact that its petals are pinky-white instead of yellow! From this plant he traces the descent of the wind-fertilised rushes, the stamens of which he states hang out pensile to the breeze on long slender filaments. This is certainly not the case: the filaments of the rushes are short and rather broad, and the anthers are usually fixed by the base, and not at all more adapted for wind-fertilisation than those of such a plant as the bog-asphodel, which is regularly fertilised by insects.

From the rushes both the sedges and grasses are derived, but on different diverging lines. The former class of plants Mr. Grant Allen considers to be very degenerate in type, the calyx and petals, which were brightly coloured in the lilies, being reduced to the six small dry bristles which we find in some species of *Scirpus*. He does not explain, however, how it is that some Cyperaceous plants possess seven or eight of these bristles. But the most extraordinary suggestion is that

the female flower of a *Carex* is represented by "a single ovary inclosed in a loose bag, which may perhaps be the final rudiment of a tubular bell-shaped corolla like that of a hyacinth"! Surely the nature of the utricle of a *Carex* has been clearly enough demonstrated by the structure of the flowers of monstrous specimens and of allied genera. To complete his remarks upon the sedges he adds a footnote, in which he says: "The sedges are not in all probability a real natural family, but are a group of heterogeneous degraded lilies, containing almost all those kinds in which the reduced florets are covered by a single conspicuous glume-like bract." Now there is probably hardly any large order in the vegetable kingdom so natural as that of the Cyperaceæ, so little connected with any other, and of which the genera are so closely allied together, as is proved by the comparatively small number of genera in it, and the large number of species which many of the genera contain.

The wheat plant being a degraded lily, it becomes necessary to trace the development of the flower of the one into that of the other, which is done by considering the palea of the wheat-flower as homologous with the calyx, and the lodicules as representing the corolla, a view which has long been considered untenable.

The two essays upon the distribution of plants call for some comment. Here the author is on firmer ground, for, thanks to the researches of Forbes and Watson, we have a much clearer notion of the origin of our flora than we can have of the pedigrees of the plants themselves. At the same time we must take exception to the suggestion that the seeds of the northern Holy Grass, which Robert Dick discovered in Caithness, were introduced into New Zealand from Siberia upon the feet of a belated bird. The plant in question does not occur, as far as is known, in New Zealand. The species which does occur both in New Zealand and Europe is found throughout the temperate Antarctic zone, extending even to the Cape. Nor is this distribution, as the author states, a very rare and almost unparalleled coincidence. The fact is that there is a very considerable number of plants common to the north and south temperate regions, most of which occur in North America, and seem to have descended towards the Antarctic regions along the line of the Andes.

But, apart from improbabilities in theory, there are numerous statements which cannot fail to convey erroneous impressions of plant-physiology. What, for instance, could be more misleading than the following statement concerning *Potentillas*? Those "which raised their leaves highest would best survive, while those which trailed or kept closely along the ground *would soon be starved out for want of carbonic acid!*" It is not the absence of carbonic acid gas that the plant would suffer from, but from the loss of light by which it could utilise it. These statements, and many others of a similar nature, suggest that Mr. Grant Allen has confined his observations too much to the flora of the British Islands. It is utterly impossible to form any correct idea of the history of the evolution of a plant without knowing thoroughly the structure of all the plants in any way related to it, and without having, moreover, a much clearer knowledge of the effects produced by external circumstances in modifying organs than we at present possess. In the meantime dogmatic statements concerning the evolution of

any given plant are in the highest degree unsatisfactory, and likely to lead to error.

The book is nicely got up, and the language is in that easy and fluent style in which Mr. Allen is so proficient, and which goes so far towards investing the driest details of science with a poetical and even romantic interest.

H. N. R.

### OUR BOOK SHELF

*Wonders of Plant-Life.* By Sophie Bledsoe Herrick. (London: W. H. Allen and Co., 1884.)

THIS is another well-intentioned but unsuccessful attempt to deal in a popular style with some of the more sensational parts of the science of botany. Inaccuracy is again the glaring fault: thus we read on p. 4 that "vegetable cells, in the earlier stages of development, generally approximate to the sphere in form"; on p. 17 that the vessels "serve to convey air through the tissues of the plant," and "are the lungs of the plant"; and again, on p. 24, that the red and ultra-red rays are those actively concerned in the process of assimilation. Similar inaccuracy may be traced in those of the illustrations which are original; for example, the drawing of *Penicillium* on p. 60. The frequent production of popular treatises shows that there must be some demand for such books. It is much to be desired that some botanist who is really master of his subject would take the matter up, and write in a popular style a trustworthy account of those parts of the science of botany which are of especial interest to the general public.

*Histological Notes for the Use of Medical Students.* By W. Horscraft Waters, M.A. (London: Smith, Elder, and Co., 1884.)

IN the introduction to this little work of 65 pages Mr. Waters states that, in taking the class of Practical Histology at the Owens College Medical School during the summer sessions of 1882-83, it had been his custom to give each student "sheets" containing a short account of the chief points to be observed in the specimens for examination. The present work has grown out of these notes, after careful revision and additions thereto by the author. Students of histology have already numerous similar treatises placed at their disposition, describing the various methods of staining, clearing, and mounting specimens; but room will always be found for additional ones bearing on this subject, provided they are the outcome of practical experience. These notes have been carefully prepared; the directions given are clear and concise, and beginners cannot do better than carefully follow them.

### LETTERS TO THE EDITOR

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[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

#### Pile-Dwellings on Hill-tops

I OBSERVE this question to the fore in *NATURE* of February 21 (p. 382), and as I have lived many years among races who build various forms of pile-houses, and have often resided in them for a time, I trust you can allow me a few words on the subject. The custom seems attributed to several causes, *i.e.* to excessive moisture and as a protection against wild beasts, by Mr. Keane; to excessive rain and a wet climate, by Col. Godwin-Austen; to damp exhalations from tropical soil, by Mr. Dallas; and to the